VIZ - Visualization Tool

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One of the toughest challenges for science teams conducting experiments remotely during a tele-operated planetary exploration mission is to visualize a rover's position on the planet relative to objects in the environment.

A tool called Viz was used throughout the Mars Exploration Rover (MER) Mission to put teams working at mission control in Pasadena virtually in the Martian environment. Viz uses two-dimensional images to build a three-dimensional picture of the terrain.

With a keyboard and mouse, teams could drive the rover across the reconstructed Martian surface to interactively explore and plan experiments. With Viz the teams could:

* pick science targets
* select the safest, most efficient path toward the targets
* measure rock surface areas
* measure distances between rocks

Viz provided the ability to pour virtual water onto the topographical information so that scientists could hypothesize what natural forces, such as ancient water or lava flow, might have shaped the planet.

Viz is able to predict when and where on Mars the sun will cast shadows on a rover and land surfaces, enabling mission planners to capture good images and other data. Scientists can use Viz to pan and tilt a rover's camera to preview an image before sending the real rover over to take a shot.

Viz supports network communications so that two or more people can communicate through Viz. The team that created Viz plans to play a role in the next Mars rover mission, the 2009 Mars Science Laboratory (MSL), which calls for onboard autonomy and remote operations.

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